Appendix B

Siting Checklist

When preparing to emplace a JTAGS unit, site selection is important for a number of reasons. The following is a listing of the general, power, electronic, and host-support considerations that must be taken into account when selecting the emplacement site for JTAGS. These considerations are basically the same for urban and nonurban areas. Within an urban environment, more line-of-sight obstacles (to DSP satellites) will be encountered and there will be additional requirements for deconfliction of frequencies.

GENERAL INFORMATION

JTAGS SITE

B-1. JTAGS requires approximately 10,000 square feet of area for operations (100 feet X 100 feet). The site should be relatively level (less than a 10-percent grade), out of the floodplain, and have a good view of the sky. The site must provide for a direct "drive-in" capability.

SHELTER

B-2. JTAGS is a 20-foot-long by 8-foot-wide ISO shelter. Mobilizers attached at each end extend the overall length to 37 feet. The footprint of a deployed JTAGS shelter also includes a trailer-mounted generator set, three mission antennas, and three UHF communication antennas. The shelter alone weighs 14,200 pounds. The total weight of the shelter with the mobilizer set attached is 20,500 pounds. An overhead view of the shelter is seen in Figure B-1.

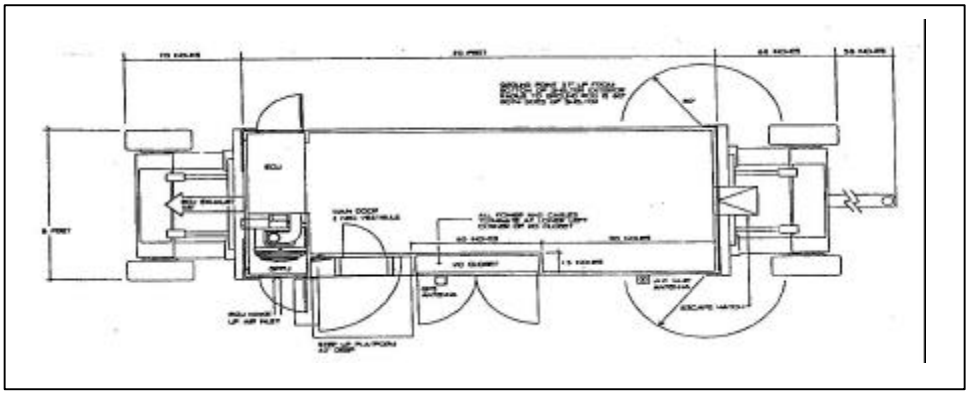

Figure B-1. JTAGS Shelter Plan View

ANTENNA LOCATION

B-3. Antenna placement must be within supplied antenna cable length restrictions. Antennas must have an unobstructed view of the satellite. All antenna fields of view must be clear of possible sources of interference with downlink reception (see Electronic section in this appendix). Antenna look angles are dependent on the site location and the satellite to be viewed. The antennas supplied with the JTAGS shelter are:

- Mission antenna (three each) (see Figure B-2).
- UHF communication antenna (see Figure B-3).
- Global positioning antenna (shelter mounted).

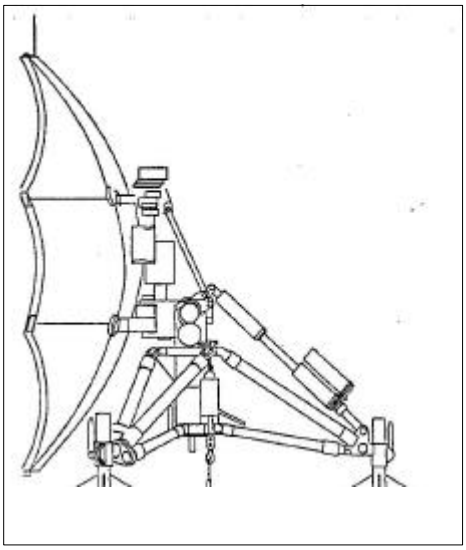

Figure B-2. Mission Antenna Elevation

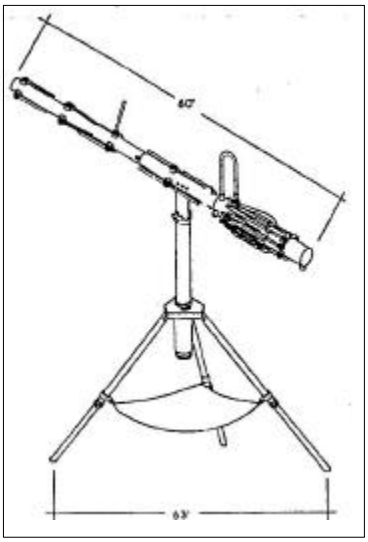

Figure B-3. UHF Antenna Elevation

Antennas used for satellite access (either sensor or communications) must be situated such that they are not looking over ridgelines or building peaks (can cause knife-edge diffraction) or through metal fences or heavy tree or other vegetation stands that can obscure their view of the satellites. For satellites that appear low on the horizon (less than 10 degrees), smooth surfaces such as concrete or water in front of the antenna can produce fading of the downlink signal strength because of multipath effects.

TELEPHONE

B-4. The JTAGS shelter accepts the following phonelines as pig-tailed cables by using a standard J1077 interface box supplied with the shelter:

- Two wire standard phonelines (nine each).
- Four wire Sectel digital nonsecure voice telephone (DNVT) data port (one each).

SITING CRITERIA

B-5. The site chosen must not be hostile either to the shelter, its peripheral equipment, or its personnel. Although transportable, the JTAGS section is not highly mobile; therefore, it is highly desirable that the JTAGS section not be forward deployed, but placed in rear echelon where it can remain relatively safe, since it is not designed to withstand direct hostile fire. The following are some general physical considerations.

PHYSICAL CHARACTERISTICS

B-6. Physical characteristics of a JTAGS site are:

- Relatively level ground (up to 10-percent grade allowable).
- Out of low lying areas.
- Not on highest point of land (lightning protection).
- No local terrain or geological instability (known earthquake fault).
- Unobstructed access to organic transport vehicles. Room for maneuvering shelter into position (i.e., turning radius = 60 feet).
- No major environmental or health hazard.
- No (or controllable) biological hazard.
- Provisions for management of heating, ventilation, and air-conditioning condensation runoff.
- Parking area for organic transport vehicles.
- Sufficient space for shelter, generator, and antenna farm. JTAGS antennas must be locatable within 30 meters of shelter.
- Single-channel ground and airborne radio system (SINCGARS) antennas should be located a minimum of 5 meters away from other SINCGARS antennas and also from the diesel generator.
- Should have good view of the sky.

POWER REQUIREMENTS

GENERAL DESCRIPTION

B-7. Preferred power for JTAGS is commercial 120-/208-Vac, three-phase, 60-Hz. Total power should not exceed 60 kW. Shelter power should be supplied by a circuit breaker or fused disconnect switch with a minimum current rating of 125 amps and a maximum rating of 200 amps.

A 60-kW trailer-mounted tactical quiet generator (TQG) towed by a 5-ton truck provides tactical power (see Figure B-4). The generator must be placed within the limit of the power cable and grounded within 6 feet of the generator's grounding lug. Adequate space is needed for refueling equipment to reach the generator. Care should be exercised in choosing the generator location with respect to the shelter's environmental control unit air intake in order to minimize the opportunity for exhaust fumes being drawn into the

shelter. The noise created by the generator set is rated at no more than 70 decibels at 7 meters (m) from the perimeter of the unit.

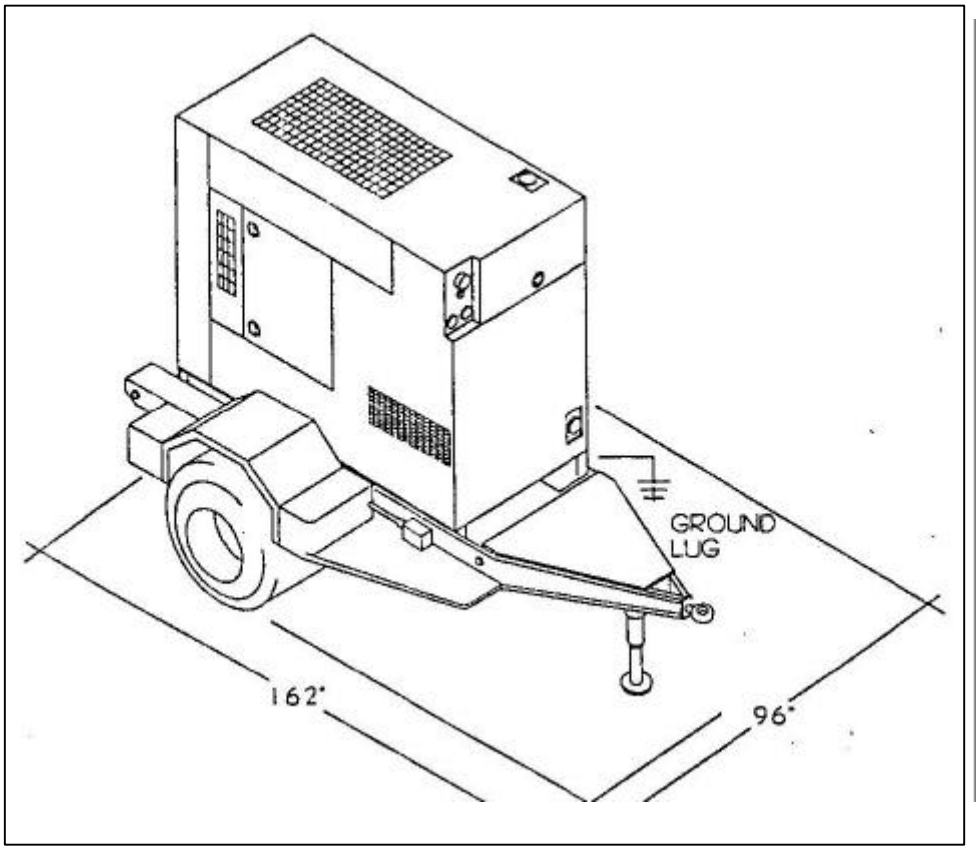

Figure B-4. Trailer-Mounted 60-kW Generator

ELECTRICAL POWER GUIDELINES

B-8. The following guidelines are recommended:

- Preferred method of electrical support is to use commercial power with the generator system as a backup.
- Ability to achieve low resistance grounding to Earth electrode as specified in MIL-STD-188-124B and MIL-HDBK-419.
- Not under or near high-voltage power lines.
- Not near a major thoroughfare (to reduce effects of ignition noise).
- Small portable gasoline-powered appliances such as lawnmowers, trimmers, and blowers must be at least 200 meters away from the JTAGS shelter during operation. Closer approach is allowable only when JTAGS is in maintenance or transport mode.
- JTAGS is designed to operate using commercial 60-Hz power when not in a tactical configuration. If 50-Hz is the only commercial power available at the host installation, a 50- to 60-Hz motor generator-converter must be used. USARSPACE is responsible for effecting

coordination to obtain the converters with the theater support command, if required. When commercial power is not be available, JTAGS uses a 60-kW TQG as the tactical power source. Generator support (i.e., maintenance, fuel, supplies, etc.) must be provided through the existing support structure.

ELECTRONIC

RADIO FREQUENCY INTERFERENCE SURVEY

B-9. The only reliable method of assessing potential radio frequency (RF) interference sources is to perform a survey by using an RF field strength meter at the selected operations site. RF emitters of many types, including the local oscillators in some up and down converters, can interfere with sensor satellite downlinks and communication links, both line-of-sight and satellite. In addition, certain high power emitters such as microwave devices and radars can be hazardous to both personnel and sensitive computer equipment.

B-10. The following recommended keep-out distances are established based on a generic electromagnetic interference (EMI) analysis; all distance values have been derived based on a smooth Earth with no significant terrain features. If a JTAGS unit, because of real estate limitations, must be placed closer to any emitter than its recommended keep-out distance, a detailed EMI analysis must be conducted to identify any type of potential interference or safety hazard prior to JTAGS emplacement. It is recognized that these keep-out distances are easily an order of magnitude greater than what would normally be allowable, but were chosen to maximize the safety factor.

MICROWAVE COMMUNICATION ANTENNAS

B-11. This is primarily a consideration for potential interference with the DSP downlink (2.230 to 2.240 GHz), since the power at the receiver is so low. The JTAGS DSP downlink antennas are highly directional and should not be placed where they have to look through a microwave antenna (in any orientation) in order to see the DSP satellite. The keep-out distances listed below take into account the Earth's curvature and normal spherical spreading loss of the microwave signal itself.

Table B-1. Keep-Out Distances

In Main Beam	10 km
In Sidelobes	5 km
Elsewhere	1 km

RADIO AND RADAR ANTENNAS

B-12. The following are considered to be minimum separation distances when the JTAGS shelter and its antennas must be placed in proximity of any radio or radar antenna. These distances include any system that operates at or near the DSP downlink frequency of 2232.5 MHz; the GPS downlink frequencies of 1227.6 and 1575.42 MHz; or which has the potential for generating any harmonics at the following distances:

Table B-2. Minimum Separation Distances

Mobile Radio Systems	5 m
Fixed and Large Radio Station Antennas	10 m
TMD GBR and Patriot Radar	1 km (in radar field of view)
	100 m (behind radar)
Other Portable/Transportable Radars	300 m
Aircraft Emitters	200 m
Friendly Countermeasures Equipment	200 m
Fixed Radar Antennas	1 km

AIRFIELDS

B-13. The required separation from airfields (air control/approach radars, communication antenna farms) is 1 km. In addition to the required separation distance from airfield emitters, JTAGS should not to be located near aircraft approach or departure corridors, nor under heavily traveled airways because of scintillation effects caused by reflection of satellite downlinks off of aircraft surfaces and the potential for interference from aircraft emitters radar, radar altimeter, electronic countermeasures, and Doppler navigator.

OTHER COMMUNICATION SYSTEMS

B-14. Communication systems such as JTIDS, SINCGARS, MSE, and TRI-TAC can present mutual interference hazards if their antennas are placed too close to a JTAGS shelter. While not a personnel hazard, they can reduce significantly each other's effectiveness and could also potentially interfere with satellite communication links. Placement of JTAGS communication and DSP downlink antennas must be accomplished so as to minimize or eliminate or cosite interference.

HOST SUPPORT

B-15. The following is a list of support services and equipment to be provided by the host base or command at which the JTAGS units are to emplaced:

- Security force/perimeter/access control.
- Personnel support facilities (billeting, messing, medical, recreational).
- Sanitary facilities (drinking water, sewage treatment).
- Area lighting.
- Lightning protection (lightning diversion if available).
- Shielding from direct sun (in hot climates if available).
- Camouflage netting (if required).
- Spare parts, logistic support.
- Fuel/oil/lubricants/fluids for generator, transport vehicles, and mobilizer motors.

- Transport and stowage of classified material, particularly cryptographic materials.
- Electrical power (60 Hz, three phase, 120/208 Vac) if available.
- Access to telephone connectivity (capable of supporting secure communications using STU-III and/or secure data device equipment — can be MSE/TRI-TAC access)